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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.  | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------|------------------|
| 10/807,605   | 03/23/2004  | Kuo-Chuan Liu        | 02EK-105600          | 3608             |
| 30764  | 7590        | 09/07/2005           | EXAMINER             |                  |
| SHEPPARD, MULLIN, RICHTER & HAMPTON LLP<br>333 SOUTH HOPE STREET<br>48TH FLOOR<br>LOS ANGELES, CA 90071-1448 |             |                      | LAM, CATHY FONG FONG |                  |
|  |             |                      | ART UNIT             | PAPER NUMBER     |
|  |             |                      | 1775                 |                  |

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/807,605

Applicant(s)

LIU ET AL.

Examiner

Cathy Lam

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 1-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 06-17-2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Election/Restrictions***

1. Applicant's election without traverse of group III (ie. claims 27-32) in the reply filed on August 11, 2005 is acknowledged.
2. This application contains claims 1-26 drawn to an invention nonelected with traverse in Paper No. filed on August 11, 2005. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 27 and 30-32 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tzu-Feng Tseng et al (Effect of  $\text{LaNiO}_3/\text{Pt}$  double layers on the characteristics of  $(\text{Pb}_x\text{La}_{1-x})(\text{Zr}_y\text{Ti}_{1-y})\text{O}_3$  thin films) or Aidong Li et al (Preparation of epitaxial metallic  $\text{LaNiO}_3$  films on  $\text{SrTiO}_3$  by metalorganic decomposition for the oriented growth of  $\text{PbTiO}_3$ ) or C. H. Lin et al (Domain structure and electrical properties of highly textured  $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$  thin films grown on  $\text{LaNiO}_3$ -electrode-buffered Si by metalorganic chemical vapor deposition).

Tseng teaches a device comprised of a ferroelectric thin film which grows onto a substrate through a metallic oxide such as  $\text{LaNiO}_3$  (P. 2506 right hand column). The

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LaNiO<sub>3</sub> (or LNO) is a perovskite oxide (ie. a crystalline or non-amorphous) and has a surface resistivity of 0.05 mΩ-cm (ie. 50 μΩ-cm).

Li teaches a device comprised of ferroelectric film(s) formed on a substrate through a LaNiO<sub>3</sub> polycrystalline film. The LaNiO<sub>3</sub> film has a resistivity of about 225 μΩ-cm at room temperature (P. 161 left hand column).

Lin teaches a ferroelectric device comprised of ferroelectric thin films formed on a LNO coated Si substrate (P. 116 top right hand column). The LNO has a surface resistivity of 225 μΩ-cm (P. 116 top left hand column).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzu-Feng Tseng et al or Aidong Li et al or C. H. Lin et al in view of Chae Ryong Cho et al (Solution deposition and heteroepitaxial crystallization of LaNiO<sub>3</sub> electrodes for integrated ferroelectric devices).

From Tseng, Li and Lin's papers, one can see that a deposition of ferroelectric material on a substrate via LaNiO<sub>3</sub> is well known in the art.

The prior art papers however are silent about the average grain diameter of the LNO layer, nor the average surface roughness of the LNO layer.

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Cho teaches a LNO layer on a substrate, the LNO layer has an average surface roughness ranges from 2.6-3.2 nm (depending on the substrate material) (page 3014 left hand column). The resistivity of the LNO film can go below  $230\ \mu\Omega\text{-cm}$  depending on the temperature (P. 3014 bottom right hand column)

The prior art are silent about the average diameter of the grains of the LNO film. In view of the prior art teachings, one skill in the art would control the grain size because it affects the bonding reliability between the ferroelectric material and the substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Cathy Lam  
Primary Examiner  
Art Unit 1775

cfl  
September 01, 2005